

ABSTRACT

Objectives of the present invention are achieved through, for example, methods for identifying useful proteins by synthesizing a protein that randomly comprises a disulfide bond/disulfide bonds, via random introduction of cysteine residues into the amino acid sequence, and analyzing the function of the protein, wherein the method comprises the steps of:

5 (a) preparing one or more mRNAs encoding a protein that comprise at least two cysteine residues, and linking each of the prepared mRNAs with puromycin or a puromycin-like compound to obtain a mRNA-puromycin conjugate(s);

10 (b) contacting a translation system with the mRNA-puromycin conjugate(s) obtained in step (a) to synthesize the protein(s), and preparing a mRNA-puromycin-protein conjugate(s); and

15 (c) contacting one or more target substances with the mRNA-puromycin-protein conjugate(s) prepared in step (b), and determining whether the target substance(s) interacts/interact with any one of the proteins of the mRNA-puromycin-protein conjugate(s).